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ontario's lake erie commercial fishery

— a social and
economic profile



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— a social and economic profile

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1975



Ministry of
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Ontario

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Cover photo: Tugs returning to Port Dover harbour. Photo by: D. P. Kolenosky

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Acknowledgement

In 1973, the Ministry of Natural Resources undertook a study with the objective of developing an economic profile of the Lake Erie commercial fishing industry. This publication is a product of that study.

Funding, complement and technical advisory services for the study were provided co-operatively by the Ministry's Commercial Fish and Fur and Policy Research Branches.

Primary appreciation must be extended, however, to the interviewees. These were the Lake Erie fishermen, operators and fish processors who gave so freely of their time and experience during the field interview phase of the study.

Introduction

This report dealing with the commercial fishery and fishermen of Lake Erie is based on several aspects of a major study undertaken by the Ministry of Natural Resources during 1973.

The objective of that study was to conduct an economic analysis of Ontario's Lake Erie commercial fishery. In essence, answers were sought to two basic questions: what is the socio-economic status of the commercial fisherman; and, what is the magnitude of the fishery's direct economic impact on the province?

The vehicle selected for the pursuit of these specific questions was a survey of the fishery, its operations and its participants. The product of these surveys was basic information relating to employment and income, sectoral efficiency and productivity, and details of the spatial and temporal distribution of costs and benefits associated with the fishery.

Contents of the total 1973 study constitute a number of largely independent reports and nowhere are all components consolidated under a single cover. Three of these components comprise the subject matter of the present report: a socio-economic survey and analysis of commercial fishermen; a survey and descriptive analysis of fish packing and processing plants; and, development of an industry impact profile.

SOCIO-ECONOMIC SURVEY

Fisheries managers have frequently expressed a need to obtain socio-economic information relating to commercial fishermen. Particularly required has been information relating to age, education, income and alternate forms of employment. Further, there has been a need to examine those reasons "why" people fish commercially, as it has often been proposed that people will continue to fish or want to fish for reasons which are not financially rational.

FISH PACKING AND PROCESSING

In addition to obtaining primary industry information, the field survey afforded the opportunity to obtain details on the secondary activities of fish packing and processing. These revealed raw material origins, employment, activity levels, product types, and patterns of marketing and distribution.

INDUSTRY IMPACT PROFILE

Data compiled and analysed in the two previous phases provided the basis for an impact profile of Ontario's portion of the Lake Erie commercial fishery. The two impact criteria selected for examination were "direct employment" and "value added".

Historical Synopsis

The commercial fishing industry of Lake Erie had its origins in the early 1800's. Prior to that, native people had harvested small stocks of fish from the rivers using a range of primitive techniques. Settlers, following the Indian example, fished with weirs and dragnets to satisfy local requirements. Fishing was concentrated in the spring months when fish were abundant inshore and deep-water fishing was virtually unknown at this time.

Pound nets (in the western basin) and gill nets (in the eastern basin) were introduced in the period 1850-1870. This new gear, plus the developing urban centres to the south and southwest, coupled with the requirements generated by the American Civil War, led to large-scale harvesting on the first truly commercial basis. However, secondary fishing industries did not develop during this era, since storage and preservation techniques were extremely crude. As a result, fish consumption was largely restricted to the local populations and to those seasons of peak availability.

At the end of the 19th century (1899) automated net lifters rapidly expanded the gill-net fishery. This innovation, combined with the efficiency of the increasingly popular trap net, led to a rapid decline of the traditional pound-net operations. Fishing methodology continued in this revised manner until the late 1950's at which time bottom trawling for smelt was introduced. This method has increased in importance to the present, particularly for the Canadian sector of the fishery.

Over the past century, the species composition of Lake Erie has undergone dramatic changes. Populations of certain endemic species have declined and even disappeared while other species, both native and introduced, have become prolific. In developing a satisfactory model of these species conversions, some of the causative factors have been identified as habitat modification, exploitation and the introduction of exotic species. However, a complete listing of all relevant factors and an indication of their relative impacts has not been produced to date.

The associated change in the composition of commercial landings culminated in the late 1950's, and was perhaps the single most important event in the history of the Lake Erie commercial fishery — both from a biologic and from an economic point of view.

Following the conversion, landings of the sixties and seventies have been largely represented by three species: yellow perch, smelt and white bass. In 1970, these species comprised over 90% of both the quantity and the value of landings taken from Lake Erie by Ontario's commercial fishermen. Smelt made its initial appearance in the landings of the early 1950's and has been nearly stable at the 10 million pound level since 1960, representing about 35% of total landings. White bass, with its fluctuating population characteristics, has been landed in annual quantities as large as 10 million pounds

and as small as 1.5 million pounds over the past 20 years. Yellow perch, always an important component, is now the mainstay of the fishery, comprising 60% to 70% of the landings.



Yellow perch, one of the mainstays of the present Lake Erie fishery.
Photo by: D. P. Kolenosky

The Socio-Economic Survey

INTRODUCTION

In the request for an economic study of the Lake Erie commercial fishery, the terms of reference stipulated that an examination be made of the reasons "why" people fish commercially. Specifically, it was proposed that:

". . . people may continue to fish or want to fish for reasons which are not wholly financially rational. This thinking, or feeling, may be partly inertia or there may be other 'social reasons'."

In satisfying this term of reference, the study undertook to test the hypothesis that commercial fishermen do not receive competitive incomes from their fishing activity, such that their choice of occupation is perhaps due to non-monetary benefits, or, to a lack of either the ability or the inclination to acquire alternative employment.

In examining this hypothesis, it was essential to determine the amount of effort expended (in terms of capital and labour) and the benefits received (in terms of income, freedom, and other amenities). This information could then be compared to local and regional conditions to determine whether monetary compensation for fishing was in fact competitive and, therefore, "financially rational". At the same time, it was necessary to assess the mobility of fishermen in both seeking and obtaining alternative employment. To obtain this information, a socio-economic survey of the Lake Erie fishery was developed.

SURVEY PROCEDURE

A personal interview survey was designed in conjunction with commercial fishery authorities, and finalized in consultation with social scientists available within the Ontario government.

In physical detail, the survey consisted of three separate questionnaires. The first was administered to individual fishermen and requested personal information including age and education, fishing experience, employment, earnings, and reasons for fishing. The second questionnaire was completed by holders of commercial fishing licences. Its purpose was to provide measures of capital and labour input as well as detailed information on the costs and catch disposal of individual fishing operations. The third questionnaire obtained information from fish packing and processing plants regarding the geographic and organizational source of fish receipts, the product types and the quantities shipped.

Field testing of the interview format and the questionnaires resulted in modifications to phraseology and question ranking. A copy of each of the finalized questionnaires appears at the end of the related section in this report.

Sampling density guidelines which were established required the interviewing of 30% of the estimated 601 fishermen on the lake and 50% of the 187 licence holders. In conjunction with these density criteria, additional guidelines ensured the obtaining of adequate geographic distribution and size class distribution within the sample. The result was that fishermen and licensees were interviewed in ten ports: Kingsville, Wheatley, Erieau, Port Stanley, Port Burwell, Port Rowan, Port Dover, Nanticoke, Port Maitland and Port Colborne. These personal interviews were conducted by two graduate biologists between July 10th and August 10th, 1973.



Fishing tugs line the wharf at Wheatley harbour. Photo by: N. R. Payne

ANALYSIS PROCEDURE AND RESULTS

Data were subjected to analysis by simple statistics (frequency distributions, summations, means and standard deviations) where applicable.

The analysis was repeated following stratification of fishermen and licensee data by selected occupational, ethnic and geographic variables.

A more sophisticated statistical analysis of the data was not warranted at the time. However, a data-coding format was utilized which would render the data compatible for cross-tabular analysis, if required at a later date.

The present report is intended to present a cursory sketch of the major variables examined in the field surveys of commercial fishermen, licence holders and processors. The report presents a descriptive overview and no attempt is made to deal with all of the study's variables nor to deal with any single variable in full detail.

The Commercial Fishermen

FISHERMAN QUESTIONNAIRE

In total, slightly over two hundred of Ontario's Lake Erie commercial fishermen were sampled. This resulted in 183 fully completed questionnaires. These 183 fishermen represented 30.4% of the 1972 fishing population, estimated at 601.

Fisherman Mobility

Information was obtained relating to three indicators of personal mobility: coincidence of home and operating ports; distance between residence and home port; and, distance between residence and birth place.

Fishermen were sampled in ten operating ports and in most (91.3%) of the cases the operating port was the same as the fisherman's home port.

Each fisherman was found to be a resident of the coastal tier of counties (Essex, Kent, Elgin, Norfolk, Haldimand and Welland) such that none lived more than 25 miles from the lake.



The fishing community of Port Stanley. Photo by: R. E. Loblaw

Two-thirds (63.4%) of the fishermen were born in this same coastal tier of counties, and eight percent (7.7%) were born in the next tier to the north. Another eight percent (8.2%) were born elsewhere in Canada (either in another Ontario county or in the province of Nova Scotia). The remaining

20.1% were born outside of Canada — the majority of them in Portugal.

Licences Held and Fished

Of those fishermen interviewed, 43.7% personally held a commercial fishing licence.

Only one licence was fished by 80.0% of those holding a licence; a single additional licence was fished by 17.5%, and two additional licences by the remaining 2.5% of the licensees. This accounted for an overall average of 1.23 licences fished per licensee.

Boat Ownership

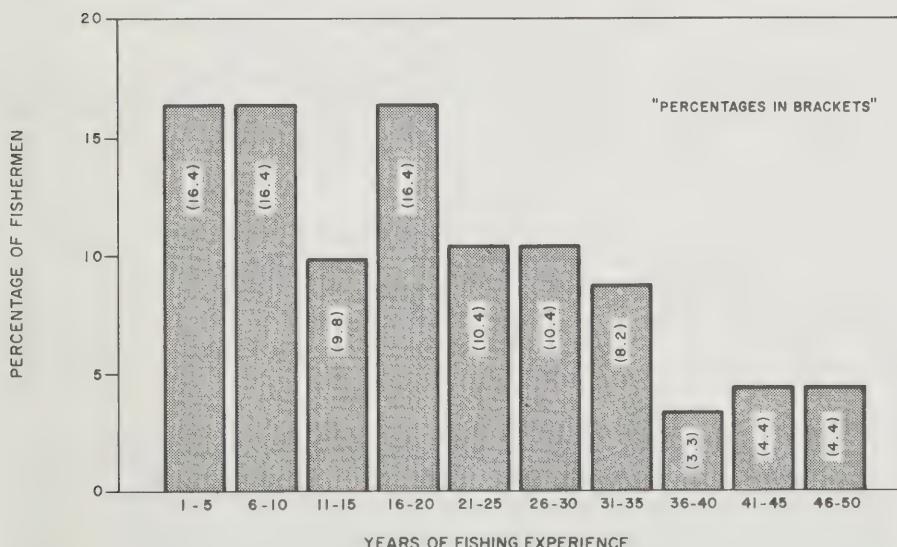
One third (31.1%) of the fishermen owned one or more boats. (The percentage distribution of boat ownership was: none — 68.9%; one — 26.2%; two — 4.4%; three — 0.0%; four or more — 0.5%.) The resultant was an average ownership of 1.19 boats for owners and 0.37 boats for all fishermen.

Boat-owning partnerships were found to be somewhat less common than was outright ownership.

Fishing Experience

The average number of years of fishing experience held by fishermen was 19.7 years and the frequency distribution of experience is illustrated in Figure 1.

FIGURE 1. THE PERCENTAGE DISTRIBUTION OF TOTAL FISHING EXPERIENCE HELD BY LAKE ERIE FISHERMEN.



Reasons for Fishing

All fishermen were questioned as to the reasons why they fished. Following this open-ended question, each fisherman was asked whether he agreed with seven specific proposals. Table 1 provides the response pattern to this latter question.

Table 1: FISHERMEN RESPONSES TO PROPOSED "REASONS FOR FISHING"

Reason	% Response		
	Yes	No	No Opinion
1. I like fishing.	95.1	2.7	2.2
2. The pay is good.	53.6	31.1	15.3
3. It fits in well with my other occupation.	15.8	78.2	6.0
4. I lack training for other jobs.	46.5	41.5	12.0
5. I can't get the type of job I'm trained for.	6.0	76.0	18.0
6. I've got too much money tied up in boats and gear to quit.	37.2	56.2	6.6
7. I like being my own boss.	72.7	16.9	10.4

Employment and Work Patterns

Of those interviewed, almost all (92%) gave their major occupation as that of commercial fisherman. Three percent listed a fishery-related job such as fish processing, while miscellaneous occupations accounted for the remaining five percent.

With respect to their job classification while fishing, half (49.7%) classified themselves as captains; 42.6% as deckhands; 6.0% as pickers (deckhands working exclusively at gill-netting operations); and, the remaining 1.6% classified themselves as shorehands.

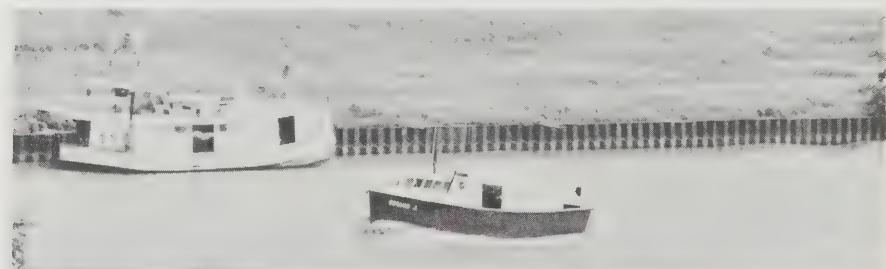
The average fishing period was 7.55 months with the most common period being 8 months and the second most common being 9 months. This level of fishing employment was supplemented by an average 1.4 months of employment at some other type of job while the remainder of the year (an average 3.0 months) was a period without any form of employment.

During the fishing months, fishermen commonly worked more than a six-day week (average 6.20, standard deviation of 0.56 days) and although quite variable, their work day was almost ten hours long (average 9.88, standard deviation of 2.03 hours).

Income

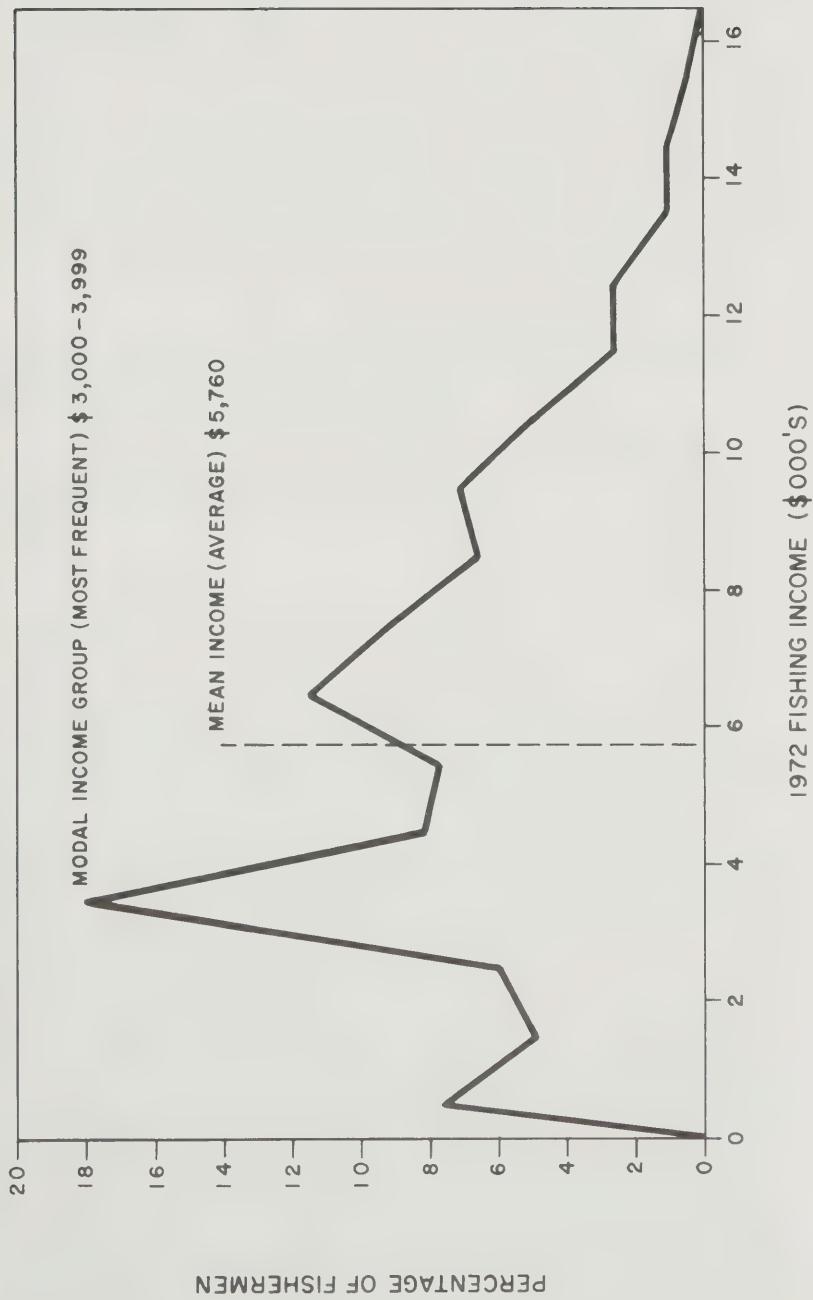
As their 1972 fishing income, the 183 interviewed fishermen received a total of \$1,054,088 which represented an average of \$5,760 per man. Income was received in four manners: shares by 72.1%; salaries by 9.8%; wages by 9.3%; and a combination of wages (or salaries) plus shares by 8.7% of the fishermen.

The distribution of 1972 income from fishing alone is depicted by Figure 2,



A tug returning to Port Burwell. Photo by: R. E. Loblaw

FIGURE 2. DISTRIBUTION OF FISHING INCOMES, BY THOUSAND-DOLLAR GROUPS, LAKE ERIE COMMERCIAL FISHERMEN, 1972.



while total income (from all sources including fishing) was distributed as follows:

\$ 0 to \$2,999	9.3% of all fishermen
\$3,000 to \$5,999	31.1% of all fishermen
\$6,000 to \$8,999	37.2% of all fishermen
\$9,000 or more	22.4% of all fishermen

Age, Education and Dependents

The average fisherman age was 39.8 years and the average level of educational attainment was 8.6 years. Most (57.4%) of the fishermen had not proceeded beyond grade school, 37.7% terminated their education in high school between grades 9 and 12, and 4.9% had continued beyond the grade 12 level.

The most frequent number of dependents was zero and the overall average was 2.0 dependents per fisherman.

DISTINCTIVE FISHERMEN STRATA

In interviewing fishermen and in analyzing the survey results, distinctive strata were noticed to exist. First, by distinguishing between captains and non-captains it is possible to reduce the statistical variation relating to several social and economic variables. Second, by distinguishing between fishermen of Portuguese and non-Portuguese origin, one can statistically determine whether or not significant social and economic differences exist between these two groups.

Stratification by Occupation

In specifying the first of these stratifications, it was recognized that there existed a very strong correlation between boat captains and licence holders. This is because most (76%) of the captains are licensees, while very few (12%) of the non-captains are licence holders. As such, it is difficult to say whether the major differences observed in Table 2 really represent differences between captains and non-captains, or between licence holders and non-licence holders.

**Table 2: SOCIAL AND ECONOMIC DIFFERENCES* EXISTING
BETWEEN CAPTAINS AND NON-CAPTAINS IN THE POPULATION OF
LAKE ERIE COMMERCIAL FISHERMEN, 1972**

*(significant at .05 level)

Variable	Total Population	Captains	Non-Captains
% Holding Commercial Fishing Licences	43.7	75.8	11.8
% Owning Boats	31.1	62.6	0.0
Years of Total Fishing Experience	19.7	22.7	16.6
Years of Lake Erie Fishing Experience	16.7	21.4	12.1
Average Months of Alternative Employment	1.4	1.0	1.8
Average Fishing Income	\$5,760	\$6,483	\$5,045
Average Age	39.8	43.7	35.9
Average Years of Education	8.6	9.2	7.9
Average Number of Dependents	2.0	2.5	1.5

Stratification by Origin

Interest in the second identification variable arose when interviews were conducted in the ports of Kingsville and Wheatley. About one-half of the fishermen in these two ports were found to be of Portuguese origin, and a language barrier made it impossible to sample this strata. This problem was overcome by having the questionnaire translated into Portuguese.

Portuguese fishermen are a very recent introduction to Lake Erie, with none of the 22 interviewees having more than five years' experience on the lake, and many (45%) having one year or less.

Analysis indicated a small but non-significant difference between the two strata. This observation was completely contrary to local fisherman opinion. Portuguese and non-Portuguese fishermen had virtually identical responses to "reasons for fishing", major occupation, residency pattern and payment basis. In addition, the similarities shown in Table 3 were observed.

Table 3: COMPARISONS BETWEEN FISHERMEN OF PORTUGUESE AND NON-PORTUGUESE ORIGIN IN THE POPULATION OF LAKE ERIE COMMERCIAL FISHERMEN, 1972

Variable	Portuguese	Origin Non-Portuguese
Years of Fishing Experience	18.6	19.9
Average Fishing Income	\$5,314	\$5,821
Average Age	34.0	40.6
Average Number of Dependents	2.05	1.96
Days Fished per Week	6.18	6.20
Hours Fished per Day	10.68	9.77
Average Number of Boats Worked On	1.18	1.38



Kingsville dockside. Photo by: G. F. Adams

The two social variables which were significantly different were those of educational achievement and employment. The most common educational level for the Portuguese fisherman was four years of formal Portuguese schooling, which the fishermen suggested was the equivalent of grade 8 in Canada. If this factor of equivalency was accepted, an average education level of 8.9 years was attained for the Portuguese fisherman (as compared to a revised average of 9.0 for the total fishery).

The difference between the two groups with respect to their 1972 employment patterns is perhaps largely attributable to the Portuguese fishermen's short period of local residency and experience in the fishery, such that more unemployment and temporary employment was experienced. If those Portuguese fishermen having no more than one year's experience on Lake Erie were removed from the sample, the period of immigrant unemployment (plus months prior to immigration which were unaccounted for by the survey procedure) and temporary employment, were eliminated. This effectively accounted for most of the distinction between Portuguese and non-Portuguese employment patterns.

Thus, differences between the Portuguese and the non-Portuguese elements were not all that basic. The concern of the traditional fishing population that the Portuguese fishermen have different fishing practices, wage demands or attitudes, appeared to be unfounded. Rather, the concern appeared to be largely attributable to the recent appearance of incumbents into a fishery where local fishing experience was high and where father-to-son tradition was the way of life. Further, it was perhaps partly due to, or aggravated by, a substantial language barrier between the two groups.

Conclusion (1)

SEVERAL DISTINCTIVE STRATA EXIST AMONG THE LAKE ERIE COMMERCIAL FISHERMEN, AND IT IS USEFUL TO RECOGNIZE AND UTILIZE THESE IN EXAMINING VARIOUS SOCIO-ECONOMIC CHARACTERISTICS.

FISHING REMUNERATION

The average fishing income earned by a Lake Erie fisherman during 1972 was \$2.87 per hour. This hourly wage was associated with more than six days per week and almost ten hours per day of fishing activity, over an average seven and one-half months. The result was an annual fishing income of \$5,760 per man.

Financially Rational?

In providing perspective to these earnings, fisherman hours, wages, and incomes were compared to those obtained by hourly-rated employees engaged in manufacturing activities, where wages are generally regarded to be "good". Three sets of comparisons were made. The first was with the total province and the others with the nearby urban centres of Chatham and St. Thomas.

Fishermen earnings were further compared to those obtainable under Ontario's minimum wage legislation (even though commercial fishing is specifically exempted from such regulations).

Table 4 illustrates that fishermen, as a group, worked an average number of hours per year. For their efforts, they received an average wage which was about 20% lower than that received by local and provincial manufacturing

wage-earners, but which was 60% higher than that guaranteed under provincial minimum wage legislation.

**Table 4: COMPARATIVE EMPLOYMENT, EARNINGS, AND HOURS
(Ontario 1972)**

	Annual Hours	Hourly Earnings	Annual Income
Manufacturing:¹			
Chatham	1945	\$3.79	\$7,371
St. Thomas	1997	\$3.74	\$7,468
Ontario	2070	\$3.47	\$7,182
Minimum Wage:²			
(General Industry)	2080	\$1.80	\$3,744
Lake Erie Fishermen:³			
Captains	1799	\$3.60	\$6,483
Non-Captains	2138	\$2.36	\$5,045
All	2004	\$2.87	\$5,760

1. Hourly-rated Manufacturing Employees

Source: DBS Cat. No. 72-002

2. Assuming 52, 40-hour weeks.

3. Fishing Activity ONLY (includes no alternate employment).

Captains received an average wage rate of \$3.60 per hour but because they worked fewer than average hours per year, their annual income was below the level for manufacturing employees. Non-captains worked an above-average number of hours and earned a much lower hourly wage. The result was an average annual income of \$5,045 which was one-third less than the provincial and the local manufacturing wage levels. It was, however, one-third greater than that earned by working a full year at the minimum wage level. In general, then, the non-captains among the Lake Erie commercial fishermen had a fishing income level which was mid-way between the selected indicator

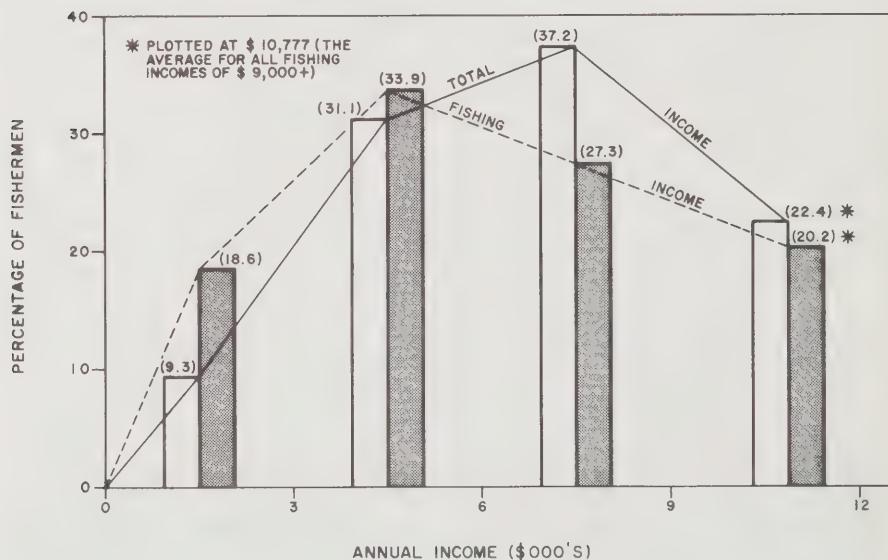


Port Dover.

incomes for the province, while the captains had an income which was quite comparable to that in manufacturing and which was substantially greater than the minimum wage level.

When considered alone, the average wage and income figures do not adequately depict the complete situation. What is hidden by the use of averages is the high degree of dispersion about the various average income levels. Although the average fishing wage of \$2.87 per hour was substantially in excess of the minimum wage guaranteed to general industry, one in every four fishermen fell below this benchmark level of \$1.80 per hour. On this basis, the financial returns from fishing begin to appear unfavourable. However, under more thorough examination, a significant consideration is that fishing is seldom a full-year activity for Lake Erie fishermen. An average 1.4 months of alternate employment, plus unemployment assistance and other forms of income were used to supplement the 1972 fishing income. The effect of these first two forms of income (neither of which is available to the manufacturing employee who works a 52 week year) was to shift the fishermen's total income curve substantially to the right of the fishing income curve, as depicted in Figure 3.

FIGURE 3. DISTRIBUTION OF FISHING INCOMES AND TOTAL INCOMES, LAKE ERIE COMMERCIAL FISHERMEN, 1972.



This shift increased the average annual income level to \$7,541 which was 5.0% higher than the provincial manufacturing average and more than double that provided by a full year of employment at the guaranteed minimum wage. More importantly, from an equity point of view, the total income curve was characterized by a reduced standard deviation about the mean income level, in that very few men with high fishing incomes received additional income; whereas most with low fishing incomes benefited substantially from alternative income sources. This could be illustrated by looking at the very high and the very low income groups. At the lower end of the income scale, one-fifth (18.6%) of the men had fishing incomes of less than \$3000. Exactly one-half of these

people earned enough additional income from other sources to give them a total income which was above the \$3000 level. At the high end of the income scale, 20.2% had fishing incomes of more than \$9000. However, additional sources of income were not common and when these were added on, only another 2.2% of all fishermen were added to the list of those with incomes exceeding \$9000 per year.

Boat owners in the fishery normally received 60% of the catch value. The 60% share included fishing income, the recovery of operating and capital costs, and some amount of surplus. This surplus was either drawn off as additional income or was reinvested in the operation to increase the capital value of the enterprise. To the extent that the latter occurred, the average total income data which were developed from the field survey were underestimates of the total financial benefits. Similarly, the standard deviation was an underestimate of the true dispersion, since boat ownership was strongly correlated with the higher income groups.

Without attempting to include an estimate of any non-income financial benefits such as mentioned in the previous paragraph, or attempting to take out those fishermen over 65 years of age (and therefore receiving Canada Pension Plan payments), it is apparent that commercial fishermen as a group received financial benefits which were substantially in excess of those provided under minimum hourly wage guarantees, and which were quite competitive with those received by hourly-rated manufacturing employees. However, this conclusion must be very clearly prefaced by the fact that income variation was substantially greater in commercial fishing than it was in manufacturing. Thus, although Lake Erie fishermen, as a group, received competitive financial benefits from their occupation, there clearly existed individual fishermen who did not.

Non-Financial Amenities

Aside from direct income and other forms of financial benefits, fishing provided certain non-financial amenities to those selecting it as a way of life.

Almost all fishermen (95.1%) agreed that they fished because they "... like fishing". Most explained this in terms of enjoying the fresh air and water, and the association with fellow fishermen.

The second non-financial amenity considered was that many men fished because of the opportunity to be their "own boss". This reason was strongly supported by the captains (93.4% agreed, 5.5% did not). Somewhat unexpectedly, however, many of the non-captains also gave this as one reason why they fished (only 28.3% rejected it). In explanation of this, it is suggested that although crew members worked under a captain, most had their own job to do aboard the boat without direct supervision. Several pointed out that there were no time clocks to be punched as in other jobs. Yet, perhaps the major reason for this feeling of freedom was that 88% of these non-captains received at least some part of their income as a direct share of the catch value. They considered themselves to be sharing in the decisions and successes, and instrumental in affecting the viability of that particular operation.

Mobility

Among their reasons for fishing, about one-half of all fishermen indicated that they lacked training for other types of jobs. Of the half which was trained

for alternate employment, only one in every eight said he was fishing because he couldn't get a job of the type which he was trained for.

Analyses of the survey results demonstrated several areas of substantial immobility among the fishermen. First, they possessed limited work skills (one half knew nothing else), and limited formal education (the average was less than 9 years and only one in fourteen had training of any kind beyond grade 12). Second, they exhibited geographic immobility as characterized by the fact that the distance between a fisherman's place of birth and his present home was less than 25 miles in over two-thirds of all cases. Third, a select group of fishermen (largely the licensees and boat owners) encountered financial immobility. These men had capital tied up in the fishery in the form of boats, nets, and shore facilities. These types of capital were sufficiently non-mobile that three-quarters (73.2%) of the boat owners regarded this as one reason why they continued to fish. Finally, most fishermen were socially immobile. Many were of advanced ages (the average was 40 years, 23% were beyond 50, and 8% were older than 60 years) and the substantial average of 20 years' experience in fishing (20% had fished for over 30 years) implied that they know no other way of life. As a group, the Lake Erie fishermen held a strong attachment to this life style and many suggested that fishing had been something their fathers had done, and was something that their sons would do: "... fishing is in my blood".

Conclusively, there is substantial support for claiming that many individuals fish, quite aside from the question of combined financial and non-financial compensation, because they experience occupational, geographic, social and financial immobility.

Conclusion (2)

LAKE ERIE COMMERCIAL FISHERMEN, AS A GROUP, OBTAIN COMPETITIVE HOURLY WAGES FOR THEIR FISHING LABOUR. CERTAIN FISHERMEN (BASICALLY THE NON-CAPTAINS) DO NOT. THIS IS, IN MOST CASES, COMPENSATED FOR BY INCOME FROM ALTERNATIVE EMPLOYMENT AND FROM UNEMPLOYMENT INSURANCE PAYMENTS, AND ALSO BY NON-FINANCIAL AMENITIES FOUND IN THE JOB. THE ACCEPTANCE OF "FINANCIALLY NON-RATIONAL" EMPLOYMENT BY A SMALL NUMBER OF FISHERMEN IS LARGELY ATTRIBUTABLE TO IMMOBILITY CHARACTERISTICS OF THE FISHERMEN, RATHER THAN TO A SCARCITY OF LOCAL ECONOMIC OPPORTUNITY.

QUESTIONNAIRE 1

COMMERCIAL FISHERMAN QUESTIONNAIRE: To be completed by commercial fishermen.

Today's Date:

Name: ANONYMOUS

Home Port:

Present Operating Port:

Commercial Fishing Licence Number(s) that you are
fishing under:

SECTION A.

(1) Do you personally hold a commercial fishing licence? YES NO

(i) If yes, what is the licence number?

(ii) If yes, how many licences other than your own did you fish last year?

NONE ONE TWO THREE FOUR OR MORE

(2) How many boats are you the owner or part-owner of?

Owner: (number of boats)

Part-owner: (number of boats)

(3) What is your job on the boat?

(4) How many years have you been a fisherman?

(5) How many of these years were on Lake Erie?

(6) What would you say are the reasons why you fish?

a)
 b)
 c)

(7) Other fishermen have suggested the following reasons. Do you agree with these reasons?

	YES	NO	NO OPINION
a) I like fishing.
b) The pay is good.
c) It fits in well with my other occupation.
d) I lack training for other jobs.
e) I can't get the type of job I'm trained for.
f) I've got too much money tied up in boats and gear to quit.
g) I like being my own boss.

SECTION B.

(1) Last year, how many months did you fish?

(2) How many months did you work at another kind of job?

(3) When fishing, how many **days a week** do you usually go out?

(4) About how many **hours a day** would you work?

(5) How many different boats did you fish on last year?

SECTION C.

(1) Taking a year like last year, approximately what would be your earnings from commercial fishing? (circle appropriate one)

a) Salary	\$.....	per week, month, year.
b) Wages	\$.....	per day, month, year.
c) Share Basis representing	\$.....	% of landed value, per week, per year.

(2) Last year, which category did your **total income from all sources** fall into?

Less than \$3000	<input type="checkbox"/>	\$6000 to \$8999	<input type="checkbox"/>
\$3000 to \$5999	<input type="checkbox"/>	\$9000 or more	<input type="checkbox"/>

SECTION D.

(1) What do you consider to be your major occupation? (Check one)

Fisherman
 Job related to fishing (e.g. fish products)
 Farmer

Labourer	<input type="checkbox"/>
Skilled Tradesman	<input type="checkbox"/>
Business or Commercial	<input type="checkbox"/>
Professional	<input type="checkbox"/>
Retired	<input type="checkbox"/>
Other (specify)	<input type="checkbox"/>

SECTION E.

(1) Where do you live?

(2) Where were you born? Town

Country

(3) What age group are you in?

Less than 20	<input type="checkbox"/>
20 - 29	<input type="checkbox"/>
30 - 39	<input type="checkbox"/>
40 - 49	<input type="checkbox"/>
50 - 59	<input type="checkbox"/>
60 or more	<input type="checkbox"/>

(4) What was the last year of school that you completed?

(5) How many dependents do you have?
(wife, children, parents, etc. that you support)

ADDITIONAL FISHERMAN COMMENTS:

The Fishing Operations

LICENSEE QUESTIONNAIRE

Ninety-two of the 189 licensees in the fishery were sampled, resulting in eighty-one fully completed questionnaires. The remaining eleven questionnaires were missing one or more pieces of information yet were still utilizable for much of the analysis.

Fishing Fleet

Four out of every five boats (79%) were in the "forty foot plus" category, 13% were in the 20' - 39' range, and a small group of 8% were under 20' in length.

The average original boat purchase price was \$18,556. Associated with this was an average boat age of 21.9 years and a present sale value of \$23,494.

Fishing Modes

Of the total boat-months spent fishing, three-quarters (76%) consisted of gill-netting operations. The next most prevalent was trawling (20%), followed by trap-netting (2%). The remaining 2% consisted of various "other modes" primarily baited hooks.

Labour and Employment

During 1972, it was normal practice (87% of the cases) for the licence holder to personally fish and to be among the average crew size of 3.20 men on board each boat. Another 0.46 men per boat were stationed on shore for the purposes of net mending, fish packing, and managing the business end of the fishing operation.

To attain an average crew size of 3.66 during the fishing season, the boats employed an average 2.78 men on a regular (more than 6 months) basis, 0.96 men on a part-time (2 to 6 months) basis, and 0.76 men on a casual (less than 2 months) basis. This represented a total of 4.50 different individuals per operation over the course of the full season.

Operating Costs

The "average" operation for 1972 may be profiled by the characteristics and costs detailed in Table 5.

Local Economic Impact

Table 5 illustrates that 53% of the catch value was directly distributed to fishermen in the form of income. Another 20% went into the local building and repairing of nets and boats, while a further 8% was spent on dockside fish packing and marketing (largely wages).

Thus, of the \$5,375,000 landed value in 1972, most was distributed to local residents in the form of wages, salaries and shares. Each fisherman and shore-hand employed in the primary fishing activity during 1972 lived in the coastal tier of counties and within 25 miles of the lake. The labour-intensive nature of the enterprise, the very localized residency, and the geographic immobility of the fishermen are each suggestive that the \$5.4 million primary activity has a very strong and highly localized economic impact.

**Table 5: PROFILE OF THE "AVERAGE" LAKE ERIE FISHERY, 1972
(182 such operations exist)**

BOAT:

Number	:	1*
Age	:	21.9 years
Original Purchase Price	:	\$18,556
Present Sale Value	:	\$23,494

ACTIVITY:

No. Months Fished	:	8.02
No. Licences Fished	:	1.225
No. Gear Modes Used	:	1.228

EMPLOYMENT:

Average No. Men Aboard	:	3.198)	Consisting of 4.495 different men
Average No. Men Ashore	:	0.462)	

REVENUE:

Landed Value	:	\$29,524.34
--------------	---	-------------

OPERATING COSTS:

	Op. Cost	% Total Op. Cost	% Total Landed Value
i) Wages and Salaries (on the boat)	\$15,746.	(58.0)	(53.3)
ii) Fuel	\$ 1,559.	(5.7)	(5.3)
iii) Ice	\$ 21.	(0.1)	(0.1)
iv) Net Replacement and Mtce	\$ 3,555.	(13.1)	(12.0)
v) Boat Maintenance	\$ 2,276.	(8.4)	(7.7)
vi) Boat financing	\$ 300.	(1.1)	(1.0)
vii) Insurance	\$ 58.	(0.2)	(0.2)
viii) Commercial Fishing Lic. Fee	\$ 141.	(0.5)	(0.5)
ix) Wages and Salaries for Fish Packing and Marketing	\$ 2,442.	(9.0)	(8.3)
x) Fish Boxes	\$ 0.	(0.0)	(0.0)
xi) Miscellaneous (shore facilities, docking fees, general business costs)	\$ 1,046.	(3.9)	(3.5)
TOTAL OPERATING COSTS	\$27,143.50	(100.0)	(91.9)
SURPLUS**	\$ 2,381.	(8.8)	(8.1)

* This (1 boat) is the basis selected for defining a fishing "Operation".

** In this item, the normal accounting convention of including interest (financing) as a component of surplus has been violated in favour of the economic convention of identifying interest as a cost item (either implicit or explicit).

Conclusion (3)

MOST OF THE LAKE ERIE CATCH VALUE IS DIRECTLY CONVERTED INTO WAGES AND SALARIES. INDICATIONS ARE THAT SECONDARY AND SUBSEQUENT ROUND EXPENDITURES CONTRIBUTE TO A STRONG AND VERY LOCALIZED ECONOMIC IMPACT.

QUESTIONNAIRE 2

COMMERCIAL FISHING LICENCE QUESTIONNAIRE: To be completed by Commercial Fishing Licence holders.

Today's date:

SECTION A.

(1) Home Port:

(2) Present Operating Port:

(3) Commercial Fishing Licence Number(s):

(4) Size of boat normally used:

40' or over 20' - 39' under 20'

(5) Type of Fishing Operation (check more than one if applicable):

Gillnetting

Trapnetting

Pound Netting

Other (specify)

Trawling

(6) Time spent during the year carrying out the above fishing operation or operations:

Gillnetting months

Trapnetting months

Trawling months

Pound netting months

Other months

(7) Cost of boat when originally purchased:

(8) Present sale value of boat:

(including all new equipment, motors, electronics, etc.)

(9) Age of boat:

SECTION B.

With respect to last year, (January 1972 to December 1972),

(1) Did **you** (the licence holder) actually fish?

YES NO

(2) What was the average number of men **on board** for a day's fishing?

(3) What was the average number of people **on shore** for a day's fishing? (These are men and women involved in fish packing, office staff, repairing gear, etc.)

(4) Over the whole 1972 year a total of how many different men were employed (both on board and on shore)?

a) on a regular basis (more than 6 months)

b) on a part-time basis (2-6 months)

c) on a casual basis (less than 2 months)

SECTION C.

(1) What per cent (%) of your landing is sold to the following people and where are they located?

a) processors: Location:
b) wholesalers: Location:
c) retailers: Location:
d) packers: Location:
e) others: Location:

(2) What is the final destination of your catch?

(3) a) How many tons of fish did you land last year? tons
or
b) Less than 100 tons 100-500 tons More than 500 tons

SECTION D.

(1) What would you estimate as your cost for the following items for last year's fishing operation:

(i) Wages and salaries (on the boat)
(ii) Fuel
(iii) Ice
(iv) Net replacements and net maintenance
(v) Boat maintenance (winches, motors, hull, etc.)

(vi) Boat financing
(vii) Boat insurance:
 (a) Government
 (b) Other
(viii) Commercial Fishing Licence Fee
(ix) Wages and Salaries for catch packing and marketing

(x) Fish boxes
(xi) Miscellaneous (e.g. shore facilities, general business costs)

ADDITIONAL LICENCE HOLDER'S COMMENTS:

Fish Packing and Processing

INTRODUCTION

During the field phase of the study, a survey was conducted of all Ontario packing and processing plants which received fish from Lake Erie. Twenty such establishments were identified and sixteen of them were cooperative in completing an interview questionnaire.

Although the four non-cooperating fish handling facilities were important in the provincial context they received minor amounts of their total requirements from Lake Erie. Thus, the unavailability of information regarding their operations did not adversely affect the total measure of the secondary activity.

Packers and processors provided basic information regarding periods of activity and employment levels in their facilities. Information relating to the scale of operation, the geographic and organizational source of fish received and the type and destination of product was also volunteered.

EMPLOYMENT

During 1972, Lake Erie fish packers and processors employed a total staff of 599 during a typical fish-processing month. However, only three plants processed fish for a full twelve months and nine and one-third months was the overall average period of operation. Two of the plants were horizontally diversified to process vegetables and other agricultural produce in addition to processing fish.



*A lakeside view of H. H. Misner's processing establishment, Port Dover.
Photo by: G. F. Adams*

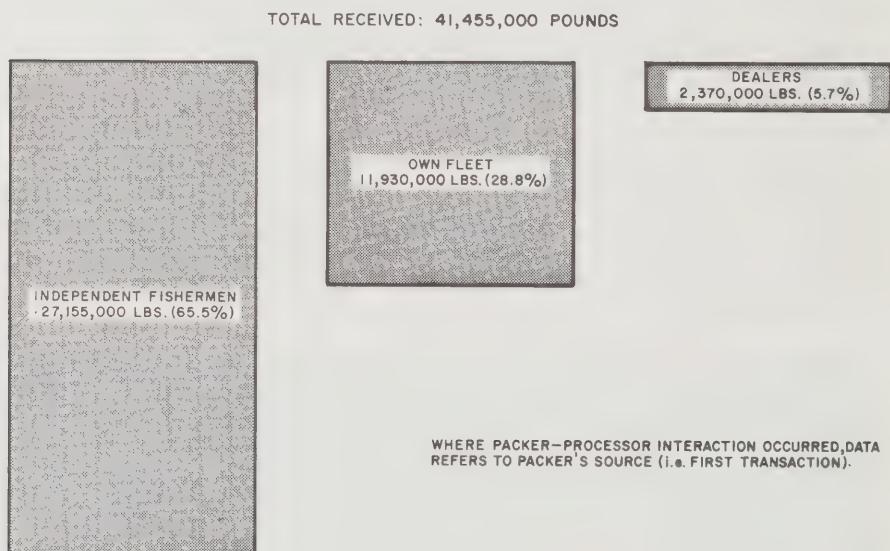
In total, fish packing and processing facilities provided 515.8 man-years of employment in 1972, two-thirds (66.3%) of which was female employment.

FISH RECEIPTS

The establishments handled 54 million pounds of fish in 1972. About 12.6 million pounds of this was double-counted in that it was initially received by a packer and subsequently forwarded to a processor. After eliminating this redundancy, the packing and processing industry reported receiving 41.5 million pounds of fish, of which 36.9 million were from Lake Erie. Another 1.0 million pounds were landings from other Ontario lakes and the remaining 3.5 million pounds originated outside of Ontario (chiefly on the prairies and the Atlantic seaboard, although small quantities originated as far away as South Africa).

In terms of industry organization, two-thirds of the fish receipts came from independent fishermen, almost one-third was landed by fleets owned by the packers and processors and a remaining small percentage was purchased from fish dealers. (See Figure 4.)

FIGURE 4. ORGANIZATIONAL SOURCE OF FISH RECEIVED BY LAKE ERIE PACKERS AND PROCESSORS, 1972.



TRANSPORTATION

As in many other activities, transport is a major aspect of the fish and fish products industry. Three stages of transportation were recognized. These were: primary transport (dockside to initial packer or processor); intermediate transport (from packer to processor); and secondary transport (to market from either a packer or a processor).

The movement of fish was traced from dockside to market by detailed analysis of the fish packer and processor questionnaires. Since most of the catch was exported to the United States, both Canadian and United States carriers were utilized. The assumption was made that all transportation within

Ontario, regardless of the head office location or registration of the carrier, was activity entirely related to the Ontario economy; while all transportation outside of the province was entirely related to the economy of other jurisdictions. By illustration, if a truckload of fish was dispatched from one of the processors to an American city, the base adopted for deriving the direct impact of the shipment on the Ontario economy was the ton-mileage of transport only within Ontario (on the most direct route to that city).

This procedure identified a total of 3.1 million ton-miles of transportation within the province, consisting of 3.8% primary transportation, 22.7% intermediate transportation and 73.5% secondary transportation. This represented an estimated \$79,164 in wages being paid for 11.54 man-years of employment.



Omstead Foods Limited is Ontario's and Lake Erie's largest freshwater fish processor.
Photo by: D. P. Kolenosky

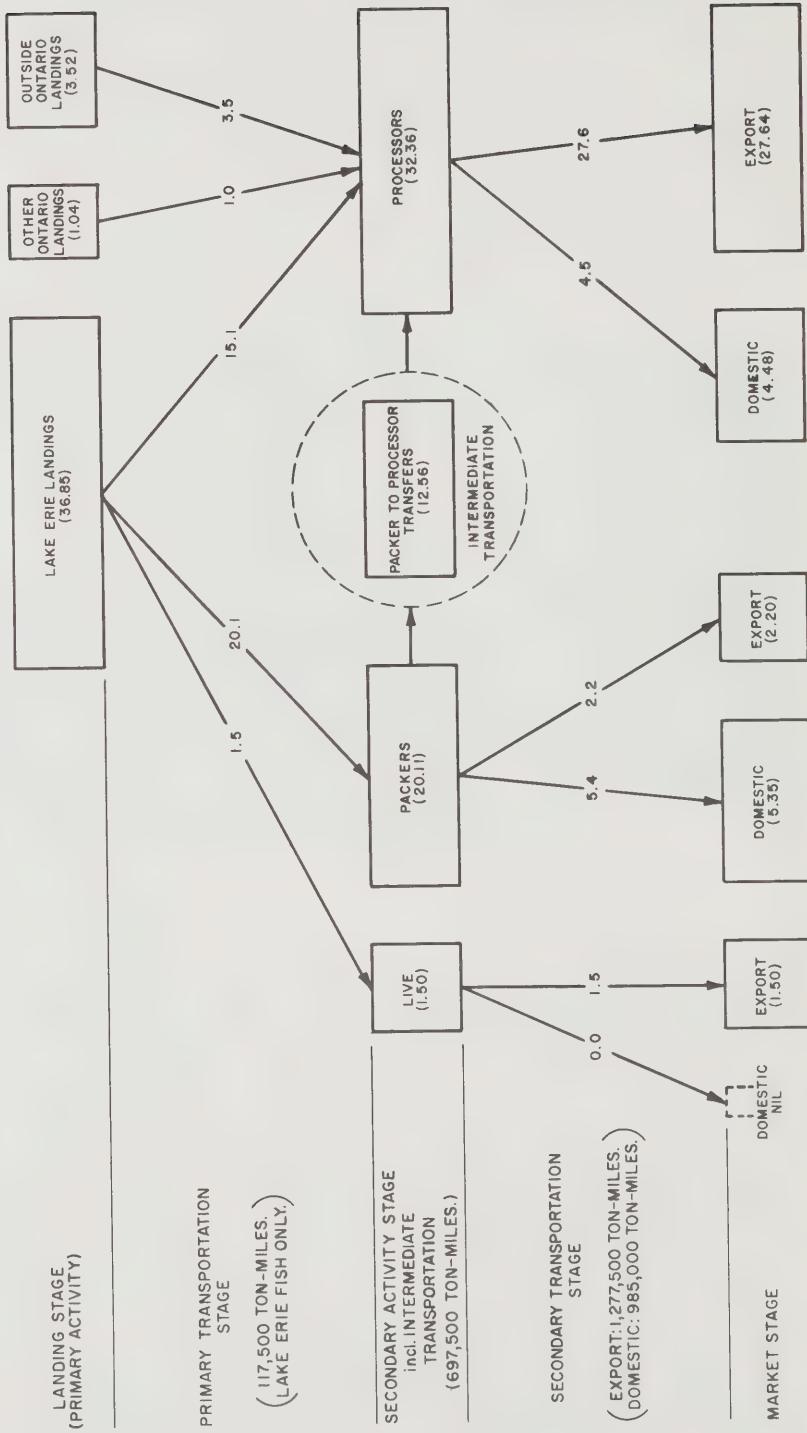
PRODUCT DISPOSITION

The current study identified three basic products and followed these through to their major market area. The three were live fish, fresh packed fish and processed fish. Measured in terms of landed-equivalent weights the percentage distribution of these types of product was 3.6%, 18.2%, and 78.2%, respectively.

Three-quarters (76.1%) of these fish products were exported, mostly to the United States, and one-quarter (23.9%) was consumed domestically. The domestic consumption consisted of approximately 5 million pounds of fresh packed fish and an equal amount of processed fish. Virtually all of the fresh fish was sold for use as animal feed whereas the domestic consumption of processed fish consisted almost entirely of fresh fillets. The major consumption centres were Toronto and Montreal while a small amount (6.1% of domestically consumed, processed fish) was sold over the counter by processor-operated retail outlets located in several of the ports.

Figure 5 is a schematic which condenses much of the material presented in this section and may be found useful as an overview of the fish packing and processing industry which is dependent on Ontario's Lake Erie harvest.

FIGURE 5. LAKE ERIE FISH PACKING AND PROCESSING, 1972: (MILLIONS OF POUNDS, LANDED EQUIVALENT WEIGHTS)



QUESTIONNAIRE 3

FISH PROCESSING PLANT AND PACKING PLANT

Today's Date _____

Name of Plant
Location
Owner(s)
Number of years at present location

SECTION A.

(1) Number of months spent operating in a year:

a) At fish processing *and/or* packing months
b) Other (specify) months
(e.g. ice making, vegetable freezing, etc.)

(2) Average number of employees (during a fish processing *and/or* packing month): Male Female

SECTION B.

(1) Amount of fish received last year pounds

(2) Value (approximate) of fish received last year:

(a) Gross receipts: \$
(b) Total dockside value: \$

(3) Total Number of Pounds of fish received last year pounds

(4) Geographic source of fish receipts:

(a) Origin of Fish (by Lake and Port)	(b) Amount of fish received (Number of pounds)	(c)* Major Delivery Mode (circle appropriate number)
(i) Lake Erie		
(a)	(a) lbs.	(1) (2) (3) (4) (5)
(b)	(b) lbs.	(1) (2) (3) (4) (5)
(c)	(c) lbs.	(1) (2) (3) (4) (5)
(ii) Other Great Lakes		
(a)	(a) lbs.	(1) (2) (3) (4) (5)
(b)	(b) lbs.	(1) (2) (3) (4) (5)
(c)	(c) lbs.	(1) (2) (3) (4) (5)
(iii) Other Ontario Lakes (other than the Great Lakes)		
(a)	(a) lbs.	(1) (2) (3) (4) (5)
(b)	(b) lbs.	(1) (2) (3) (4) (5)
(iv) Outside Ontario (specify)		
(a)	(a) lbs.	(1) (2) (3) (4) (5)
(b)	(b) lbs.	(1) (2) (3) (4) (5)

*Transportation Method used to Obtain Fish

- (1) Truck: your own
- (2) Truck: fishermen's
- (3) Truck: carrier's
- (4) Rail
- (5) Dock

SECTION C.

(1) Organizational source of fish receipts (how you obtain the fish for your plant):

	Amount
(a) By your own fishing vessels	..... pounds
(b) By fishermen under contract	..... pounds
(c) Purchased from independent fishermen	..... pounds
(d) Purchased from a dealer (distributor)	..... pounds

SECTION D.

(1) Product type:

	Amount
(a) Whole or dressed (fresh)	..... pounds
(b) Whole or dressed (frozen)	..... pounds
(c) Filleted (fresh)	..... pounds
(d) Filleted (frozen)	..... pounds
(e) Blocks and sticks	..... pounds
(f) Other (specify)	..... pounds

SECTION E.

Final Destination of Product:

	(a) Destination	(b) Amount (Pounds)	(c) ** Major Delivery Mode (circle appropriate number)				
			(1)	(2)	(3)	(4)	(5)
(i) Ontario							
(a) Toronto		(1)	(2)	(3)	(4)	(5)
(b)	(1)	(2)	(3)	(4)	(5)
(c)	(1)	(2)	(3)	(4)	(5)
(ii) Quebec							
(a) Montreal		(1)	(2)	(3)	(4)	(5)
(b)	(1)	(2)	(3)	(4)	(5)
(iii) U.S.A.							
(a) Detroit		(1)	(2)	(3)	(4)	(5)
(b) Chicago		(1)	(2)	(3)	(4)	(5)
(c) New York		(1)	(2)	(3)	(4)	(5)
(d)	(1)	(2)	(3)	(4)	(5)
(iv) Other (specify)							
(a)	(1)	(2)	(3)	(4)	(5)
(b)	(1)	(2)	(3)	(4)	(5)

- **(1) Truck: own
- (2) Truck: wholesaler's or retailer's
- (3) Truck: carrier's
- (4) Rail
- (5) Other (specify)

Fish and Fish Product Exports

Since Canada is a major fishing nation with a sparse population and moderate levels of per capita fish consumption, the vast majority of its landings are exported. These national exports of fish and fish products were valued at slightly over one-quarter of a billion dollars in 1970, representing 1.5% of total Canadian exports and 14.0% of the parent group of export commodities known as "food, feed, beverages and tobacco".

Ontario is by far the major exporting province, accounting for almost one-half of Canadian exports of all commodities and four-fifths of the inedible end product exports. In the context of this enormous trade activity, Ontario fish and fish product exports are of relatively minor significance. In 1970 they were valued at \$10 million, representing one-tenth of one percent of the value of the province's total exports.

CANADIAN EXPORTS

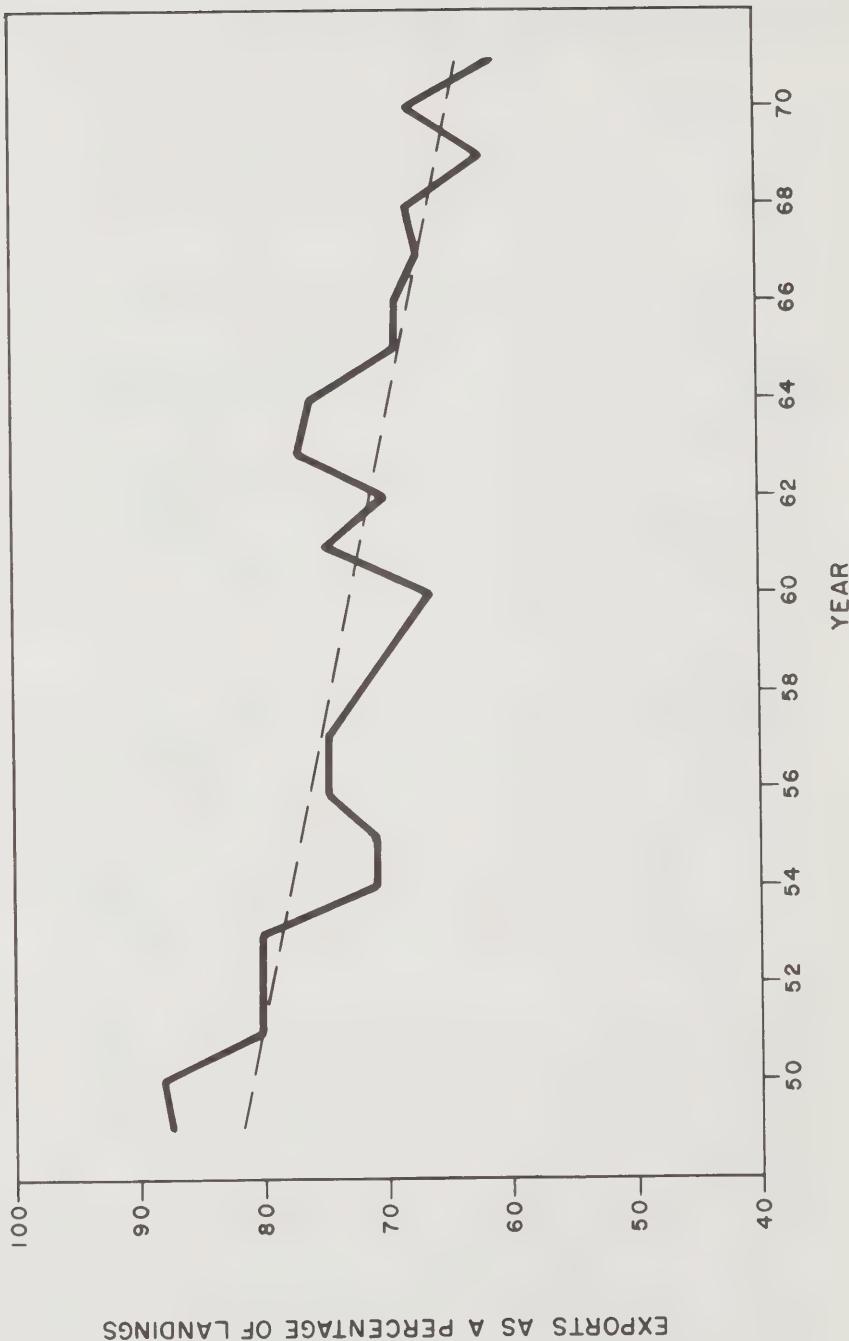
It is difficult to determine what portion of Canadian landings are exported. Statistics are readily available on the quantity and value of landings, as they are for the quantity and value of exports. However, the task of converting dressed and processed exports back into terms of landed equivalents (weight or value) must often be based on very crude conversion estimates. Factors provided in discussion with commercial fish authorities generated the trend depicted in Figure 6. It illustrates a gradual near-linear decline in the percentage of freshwater landings exported, from almost ninety percent in the post-war period to approximately sixty-five percent at present.

ONTARIO EXPORTS

Unlike the export statistics available for the nation as a whole, provincial statistics deal only with the value of exports and do not include the quantities of exports. As a result, to determine the percentage of landings which are exported, the procedures become more indirect and the data somewhat tenuous.

Two approaches were considered and pursued, yielding somewhat different results. In the first case, the export value was calculated as a percentage of the published value of domestic fishery products and by-products. The second approach was to consider the export value as a percentage of the reported value of shipments for the Ontario fish products industry. For 1969 data, the two procedures gave quite similar values — 80% for one procedure and 78% for the second. However, in 1970 the results were quite divergent at 77% and 63%. In light of the data deficiencies, the difficulties inherent in the procedures and the variation in results, it is possible only to estimate that about two-thirds to three-quarters of Ontario fish and fish products are exported.

FIGURE 6. EXPORTS AS A PERCENTAGE OF LANDINGS, CANADIAN INLAND FISH, 1949-1971



COMPOSITION OF THE EXPORTS

In 1970, the five major fish and fish product export commodities from Canada were frozen fillets (23%), shellfish (21%), frozen whole or dressed fish (12%), canned fish (10%), and frozen blocks and sticks (9%). Ontario exports consisted of only three major commodities: fresh and chilled fillets (39%); fresh whole or dressed fish (23%); and, frozen fillets (22%).

Essentially then, Ontario fish exports consist largely of highly perishable items (40% of the nation's fresh and chilled fillets and 11% of its fresh whole or dressed fish), only a small percentage of frozen commodities (2.9% of all frozen commodities combined), and a negligible proportion of the less perishable canned, smoked, salted, pickled and dried items.

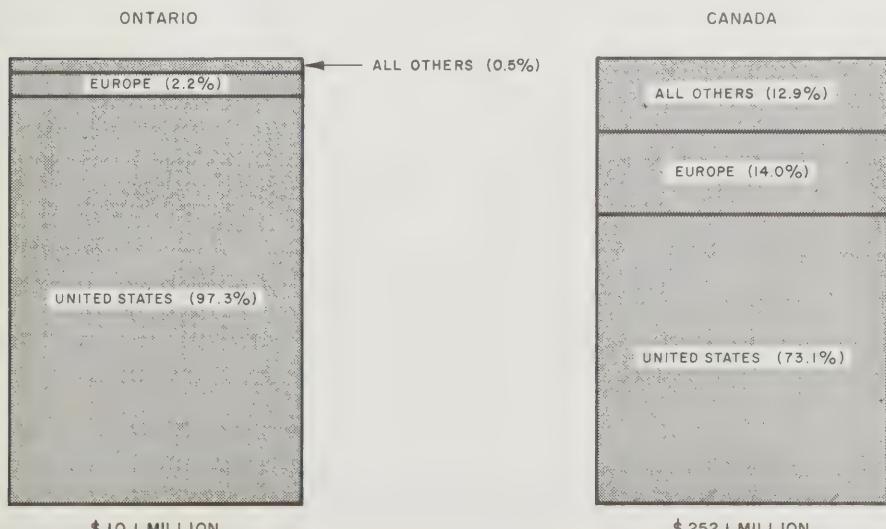
EXPORT DESTINATIONS

Three major markets exist as destinations for Canadian fish exports. The United States receives slightly less than three-quarters (by value), while the remainder is split between Europe and the rest of the world. Shipments to the latter are largely destined for the Caribbean countries.

This national distribution pattern is in marked contrast to that for Ontario in that virtually all of the province's fish exports are destined for a single market. The United States received 97.3% by value in 1970, while 2.2% were exported to Europe and only 0.5% to the rest of the world. See Figure 7.

The adjacent lake states of Michigan and Ohio are the primary market for Ontario's fish exports, receiving some seventy percent of all shipments. Detroit is the single largest fish consumption centre in the region. The second major destination is New York-Pennsylvania which receives about twenty percent of all such exports. Here, activity centres on the fish markets of New York, New Jersey and Buffalo. New England receives only three percent of total exports; Chicago and its surrounding states receive a little more than two percent (as does the West-North Central Region); and, the remaining less than one percent of Ontario fish exports filters into the Southeast Region.

FIGURE 7. DISTRIBUTION OF DOMESTIC FISH EXPORTS, ONTARIO AND CANADA, 1970.



CONCLUSION (4)

ONTARIO FISH AND FISH PRODUCT EXPORTS, CONSISTING LARGELY OF WHOLE OR DRESSED FISH AND FILLETS, ACCOUNT FOR BETWEEN $\frac{1}{2}$ AND $\frac{3}{4}$ OF TOTAL ONTARIO LANDINGS. THESE EXPORTS, VALUED AT \$10.1 MILLION IN 1970, WERE DESTINED FOR THE TWO MAJOR MARKETS OF DETROIT AND NEW YORK – NEW JERSEY. VIRTUALLY NO EXPORTS MOVED TO MARKETS SIGNIFICANTLY BEYOND THESE CONSUMPTION CENTRES.

Economic Profile of the Fishery

INTRODUCTION

This section summarizes the impact of the Lake Erie commercial fishery on the Ontario economy.

The selected measure of economic contribution is the direct or "first round" impact of the landings on three activities: the primary fishing industry; the transportation industry; and, the fish packing and processing industry. The profile does not include secondary or subsequent-round economic impacts nor does it follow the product beyond initial delivery to its major centre of consumption. Direct employment and value added are the two separate impact measures considered and in all cases the profile refers to the 1972 activity level.

DIRECT EMPLOYMENT

The ideal employment measure to be utilized is that of man-years of employment rather than simply the number of employees. In this manner, a seasonal job does not receive the same relative emphasis as does a full-time job. Such a procedure would be particularly important in the current study in that previous sections have illustrated the distinctly seasonal nature of the primary fishing and fish packing and processing activities. However, certain reservations to this general procedure may be raised, thus necessitating the inclusion of measures of both the number of employees and the number of man-years of employment.

Primary Activity

Although fishermen actively fish for only seven and a half months, they work unusually long hours per day and days per week. Thus, they effectively work a comparable number of hours during the year as would an employee engaged for twelve months in a manufacturing or white-collar occupation (see Table 4). This equivalent number of hours of employment may be argued as cause for accepting the number of fishermen as an appropriate employment measure and as a reasonable replacement for man-years of employment.

An equally valid argument can be made for converting months of employment into man-years (dividing by 12). When not fishing, a commercial fisherman tends to have the characteristics of an unemployed worker. He seeks alternate employment thereby competing for available jobs and becomes eligible for unemployment services and payments.

Adopting the former argument, the relevant employment measure was 601 men engaged in commercial fishing during 1972 and on the basis of the latter measure it was 378 man-years of employment.

Fish Packing and Processing

Due to its direct dependence on the primary activity the fish packing and processing activity is also of a distinctly seasonal nature although refrigeration and freezing processes have enabled an extension of the season. This season currently averages ten and one-third months per employee.

Utilizing the previous measures, an average of 599 persons were employed during the active season and this represented 516 man-years of employment.

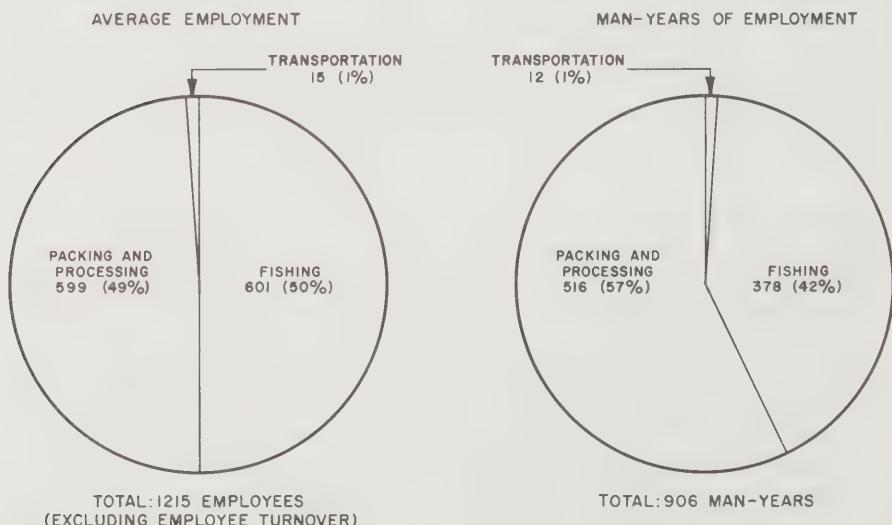
Transportation

An earlier section derived measures of the man-years of employment in primary, intermediate, and secondary transportation. The total of these was twelve man-years in 1972.

This activity was again of a seasonal nature such that average employment during the active season was a somewhat larger number. In determining this number the following estimation procedure was selected. Employment in primary and intermediate transportation was assumed to occur only during the period of active fishing (i.e. an average 7.55 months); and, secondary transport was assumed to occur over a twelve month period. The latter represented a smoothing of the seasonal nature, aided by refrigeration and freezing techniques. The resultant estimate was an average work force of fifteen employees in the transportation phase.

Figure 8 summarizes employment in the 1972 Lake Erie commercial fishery in terms of "average" employment and "man-years" of employment.

FIGURE 8. EMPLOYMENT IN THE LAKE ERIE COMMERCIAL FISHERY, 1972.



VALUE ADDED

The economic impact of the commercial fishery may equally well be evaluated in terms of the value added at each stage within the industry.

In its basic concept, value added is the measure of an activity's contribution

to the economy, after the costs of the necessary raw materials have been accounted for. In essence it represents the return to the factors of production: labour; entrepreneurship; and capital. Technically defined, value added is: (Value of Shipments) — (Cost of Purchased Raw Materials) — (Cost of Fuel and Electricity) ± (Changes in Inventory).

As a first approximation, wages and salaries tend to be a satisfactory proxy of total value added — except in those industries which are either moderately or highly capital-intensive. And, value added has the desirable advantage relative to employment as an economic impact measure, in that it effectively weights the number of jobs by the wage and salary levels generated in the industry being examined.

Primary Activity

Statistics are not collected to generate value added data for the primary commercial fishing activity. As a result, a procedure was developed to estimate value added.

The common practice of fisherman payment as a percentage of the landed value (40% going to the crew, 60% to the boat and its owner) provided the basis for the following estimation:

$$\begin{aligned}\text{Value added} &= (\text{Wages and Salaries}) + (\text{Return to Capital and Entrepreneur-} \\ &\quad \text{ship}) \\ &= (\text{Value of Landings} \times .40) + (\text{Value of Landings} \times .60 \times \frac{1}{3} *) \\ &= (\text{Value of Landings} \times .60)\end{aligned}$$

This estimate of 60% of the landed value appears realistic in that the survey data revealed that wages and salaries plus financing plus surplus totaled 62% of the landed value. Utilizing the 60% figure and the 1972 landed value of \$5,374,610 a value added of \$3,224,766 is estimated.

Fish Packing and Processing

Published statistics were available for the value added in the Ontario fish and fish products industry. However, the provincial data was not complete. Nor could data be broken out for the individual Lake Erie fishery.

As a consequence of the preceding, utilization of the published value added data was restricted to determining a statistic for the average value added per employee in the industry. This provincial average was \$12,016 per employee and if assumed to be applicable to the Lake Erie fishery, where the actual number of employees was known from the survey, a value added of \$7,197,584 was estimated.

Transportation

Utilizing data generated by the field survey, wage estimates associated with the three types of transportation were earlier developed.

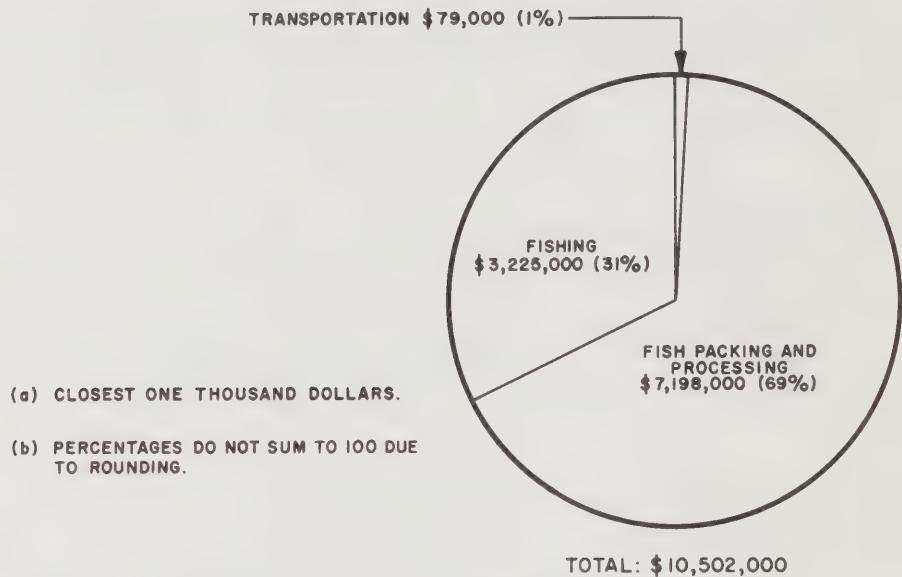
In the absence of adequate value added data, the assumption was made that direct wages and salaries to drivers adequately reflected value added in the transportation phase. Value added was then: \$4,994 for primary transport, \$29,627 for intermediate transport, and \$44,543 for secondary transport (or, \$79,164 in total).

* $\frac{1}{3}$ was calculated as a national average for this unobserved factor. Included are owner and partner wages and salaries. Excluded is the services sector.

Value Added Schematic

Figure 9 summarizes the impact of Ontario's Lake Erie commercial fishery on the provincial economy in terms of total value added.

FIGURE 9. TOTAL VALUE ADDED IN THE LAKE ERIE COMMERCIAL FISHERY, 1972.



CONCLUSION (5)

THE ECONOMIC IMPACT OF THE LAKE ERIE COMMERCIAL FISHERY IS PRIMARILY GENERATED THROUGH THREE SECTORS: FISHING, FISH PACKING AND PROCESSING, AND TRANSPORTATION. IN 1972, AN AVERAGE 1215 PERSONS WERE EMPLOYED IN THE FISHERY, PROVIDING 906 MAN-YEARS OF EMPLOYMENT AND A CONTRIBUTION TO THE PROVINCIAL ECONOMY OF \$10.5 MILLION IN TERMS OF VALUE ADDED.

Summary

The following is a simple grouping and restatement of major conclusions derived from the 1973 socio-economic study of Ontario's Lake Erie commercial fishery.

1. Several distinctive strata exist among the Lake Erie commercial fishermen, and it is useful to recognize and utilize these in examining various socio-economic characteristics of the fishermen.
2. Lake Erie commercial fishermen, as a group, obtain competitive hourly wages for their fishing labour. Certain fishermen (basically non-captains) do not. This is in most cases compensated for by income from alternative employment and unemployment benefits and also by non-financial amenities found in the job. For those who accept financially "non-rational" employment, immobility characteristics rather than a scarcity of local economic opportunity appear to be the reason.
3. Most of the catch value is directly converted into wages and salaries. Indications are that secondary and subsequent-round expenditures similarly contribute to a strong local economic impact.
4. Ontario fish and fish product exports, consisting largely of whole or dressed fish and fillets, account for between $\frac{2}{3}$ and $\frac{3}{4}$ of total Ontario landings. These exports, valued at \$10.1 million in 1970, were destined for the two major markets of Detroit and New York-New Jersey. Virtually no exports moved to markets significantly beyond these consumption centres.
5. The economic impact of the Lake Erie commercial fishery is primarily generated through three sectors: fishing, fish packing and processing, and transportation. In 1972, an average 1215 persons were employed in the fishery, providing 906 man-years of employment and a contribution to the provincial economy of \$10.5 million in terms of value added.

Selected References

Background: 3, 7, 10, 11
Theory: 2, 3, 4, 5, 9, 12

Studies: 1, 3, 6, 7, 8, 9
Statistics: 7, 13, 14, 15

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